

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE N/A	PAGE 1 OF 30
2. AMENDMENT/MODIFICATION NO. 0005	3. EFFECTIVE DATE DEC 09 , 2003	4. REQUISITION/PURCHASE REQ. NO. N/A	5. PROJECT NO. (If applicable) SPEC. NO. 1319_1320	
6. ISSUED BY CODE		7. ADMINISTERED BY (If other than Item 6) CODE		
DEPARTMENT OF THE ARMY U.S. ARMY ENGINEER DISTRICT, SACRAMENTO SACRAMENTO, CALIFORNIA 95814-2922		DEPARTMENT OF THE ARMY U.S. ARMY ENGINEER DISTRICT, SACRAMENTO SACRAMENTO, CALIFORNIA 95814-2922		

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)		(√)	9A. AMENDMENT OF SOLICITATION NO. W91238-04-R-0002
		×	9B. DATED (SEE ITEM 11) OCT. 30, 2003
			10A. MODIFICATION OF CONTRACTS/ORDER NO. N/A
			10B. DATED (SEE ITEM 13) N/A
CODE	FACILITY CODE		

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☒ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☒ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning 1 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required) N/A	NOTE: ITEM 13 BELOW IS N/A.
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13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(√)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. N/A
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER (Specify type of modification and authority) N/A

E. IMPORTANT: Contractor ☐ is not, ☐ is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Global Hawk Dormitory and Working Dog Kennel Beale AFB, CA
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2 Encl

1. Revised Pages: Page 36, Section 04200(Kennel)(Replace existing in its entirety)
2. Revised Drawing: A6.01 (Dormitory)

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)	
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY (Signature of Contracting Officer)	16C. DATE SIGNED

SAMPLE RESUME FORMAT

1. The individual's name and the proposed key position:

2. The total cumulative number of years the individual has worked in the proposed position:

3. Availability:

Design Phase: _____ Full-time _____ Less than Full-time _____ N/A
 Construction Phase: _____ Full-time _____ Less than Full-time _____ N/A

4. The proposed person [] will [] will not
 be an employee of the prime contractor.

5. The proposed person [] is a U.S. citizen [] is not a U.S. citizen *

6. The proposed person [] will [] will not
 have additional duties and responsibilities other than in the capacity specified above.

7. **Individual's relevant education:** (*If applicable specify ,degree/year/specialization. Attach copy of diploma or other documentation to substantiate satisfaction of minimum qualification criteria, as applicable*)

8. **Individual's active registration:** (*If applicable specify state, year, discipline and certification number and discipline. Attach a copy of current registration to substantiate satisfaction of a minimum qualification criteria, as applicable.*)

9. **Relevant Specialized Training:** (*Important Note: for the Construction Quality Control System Manager, a certificate showing completion of the Government course "Construction Quality Management for Contractors" must be attached to the resume. The completion certificate must not have expired as of the date of offer submission.*)

10. **Individual's specific qualifications and experience relevant to this project:**

(Provide any other information pertaining to the qualifications of this person for this project not specifically addressed above that directly relates to this person's qualifications for the position (for example, prior design-build experience, prior experience with projects on military installations , and prior experience on projects administered by the Corps of Engineers). A complete list of the individual's prior experience is neither required nor desired; however, sufficient information (including verifiable dates of employment) must be furnished to fully substantiate that the proposed person meets any minimum experience requirements specified in the RFP for the position. When providing project information, provide sufficient detail to establish the relevancy of the experience to this acquisition.)

11. **Letter of Commitment:** (*The Offeror is requested to attach a letter of commitment signed by the proposed key person stating his or her intent to work on this project in the specified capacity if the Offeror is awarded the contract. This letter is not included in the page limitation.*)

12. **Relevant Letters of Appreciation:** (*If the proposed key person received letters of appreciation, commendation, recommendation, etc. in conjunction with work in the same capacity on a relevant project, so indicate and attach copies. If the relevance of the project to this acquisition is not clear, explain. This attachment is not included in the page limitation. Note: The Government is not requesting the Offeror to submit letters written "after the fact" for the purpose of this solicitation.*)

* NOTE: If proposed person is a foreign **national** (e.g., not a U.S. citizen), and the offer is selected for contract award, documentation verifying that the person was legally admitted into the United States and has authority to work in the U.S. must be provided in accordance with 52.204-4003 (see Section 00800).

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SECTION 04200

MASONRY

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by basic designation only.

ACI INTERNATIONAL (ACI)

ACI 530.1	(1999) Specifications for Masonry Structures and Related Commentaries
ACI 318/318M	(2002) Building Code Requirements for Structural Concrete and Commentary
ACI SP-66	(1994) ACI Detailing Manual

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 82	(2001) Steel Wire, Plain, for Concrete Reinforcement
ASTM A 153/A 153M	(2001a) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 167	1999) Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
ASTM A 615/A 615M	(2001b) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM A 616/A 616M	(1996a) Rail Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM B 370	(1998) Copper Sheet and Strip for Building Construction
ASTM C 27	(1998) Fireclay and High Alumina Refractory Brick
ASTM C 55	(2001a) Concrete Brick
ASTM C 62	(2001) Building Brick (Solid Masonry Units Made from Clay or Shale)
ASTM C 67	(2002) Sampling and Testing Brick and Structural Clay Tile
ASTM C 73	(1999a) Calcium Silicate Brick (Sand Lime

Brick

ASTM C 90	(2002) Loadbearing Concrete Masonry Units
ASTM C 91	(2001) Masonry Cement
ASTM C 94/C 94M	(2000e2) Ready-Mixed Concrete
ASTM C 129	(2001) Nonloadbearing Concrete Masonry Units
ASTM C 140	(2001ae1) Sampling and Testing Concrete Masonry Units and Related Units
ASTM C 144	(1999) Aggregate for Masonry Mortar
ASTM C 150	(2002) Portland Cement
ASTM C 207	(1991; R 1997) Hydrated Lime for Masonry Purposes
ASTM C 216	(2001a) Facing Brick (Solid Masonry Units Made from Clay or Shale)
ASTM C 270	(2001a) Mortar for Unit Masonry
ASTM C 315	(2002) Clay Flue Linings
ASTM C 476	(2001) Grout for Masonry
ASTM C 494/C 494M	(1999ae1) Chemical Admixtures for Concrete
ASTM C 578	(2001) Rigid, Cellular Polystyrene Thermal Insulation
ASTM C 641	(1998e1) Staining Materials in Lightweight Concrete Aggregates
ASTM C 652	(2001a) Hollow Brick (Hollow Masonry Units Made From Clay or Shale)
ASTM C 744	(1999) Prefaced Concrete and Calcium-Silicate Masonry Units
ASTM C 780	(2000) Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
ASTM C 1019	(2000b) Sampling and Testing Grout
ASTM C 1072	(2000a) Measurement of Masonry Flexural Bond Strength
ASTM C 1142	(1995; R 2001) Extended Life Mortar for Unit Masonry
ASTM C 1289	(2001) Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board

ASTM D 2000	(2001) Rubber Products in Automotive Applications
ASTM D 2240	(2002) Rubber Property - Durometer Hardness
ASTM D 2287	(1996; R 2001) Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds
ASTM E 119	(2000a) Fire Tests of Building Construction and Materials
ASTM E 447	(1997) Compressive Strength of Masonry Prisms
ASTM E 514	(1990; R 1996e1) Water Penetration and Leakage Through Masonry

INTERNATIONAL CODE COUNCIL (ICC)

ICC Plumbing Code	(2000) International Plumbing Code (IPA)
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1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Masonry Work; G, RO

Drawings including plans, elevations, and details of wall reinforcement; **details of reinforcing bars at corners and wall intersections**; offsets; tops, bottoms, and ends of walls; control and expansion joints; **lintels**; and wall openings. Bar splice locations shall be shown. **If the Contractor opts to furnish inch-pound CMU products, drawings showing elevation of walls exposed to view and indicating the location of all cut CMU products shall be submitted for approval.** Bent bars shall be identified on a bending diagram and shall be referenced and located on the drawings. Wall dimensions, bar clearances, and wall openings greater than one masonry unit in area shall be shown. No approval will be given to the shop drawings until the Contractor certifies that all openings, including those for mechanical and electrical service, are shown. If, during construction, additional masonry openings are required, the approved shop drawings shall be resubmitted with the additional openings shown along with the proposed changes. Location of these additional openings shall be clearly highlighted. The minimum scale for wall elevations shall be 1 to 50. Reinforcement bending details shall conform to the requirements of ACI SP-66.

SD-03 Product Data

Flashing; G

Water-Repellant Admixture; G, RO

Manufacturer's descriptive data.

Cold Weather Installation; G,

Cold weather construction procedures.

SD-04 Samples

Concrete Masonry Units (CMU); G, RO

Color samples of three stretcher units and one unit for each type of special shape. Units shall show the full range of color and texture. Submit sample of colored mortar with applicable masonry unit.

Anchors, Ties, and Bar Positioners; G, RO

Two of each type used.

Expansion-Joint Materials; G,

One piece of each type used.

Joint Reinforcement; G, RO

One piece of each type used, including corner and wall intersection pieces, showing at least two cross wires.

Portable Panel; G

One panel of clay or shale brick, 600 by 600 mm, containing approximately 24 brick facings to establish range of color and texture.

SD-05 Design Data

Pre-mixed Mortar; G, RO

Unit Strength Method; G, RO

Pre-mixed mortar composition. Calculations and certifications of masonry unit and mortar strength.

SD-06 Test Reports

Field Testing of Mortar; G,

Field Testing of Grout; G, RO

Prism tests; G, RO

Masonry Cement; G, RO

Fire-rated CMU; G, RO

Test reports from an approved independent laboratory. Test

reports on a previously tested material shall be certified as the same as that proposed for use in this project.

Special Inspection; *G, RO*

Copies of masonry inspector reports.
SD-07 Certificates

Concrete Masonry Units (CMU); *G, RO*

Control Joint Keys; *G, RO*

Anchors, Ties, and Bar Positioners; *G, RO*

Expansion-Joint Materials; *G, RO*

Joint Reinforcement; *G, RO*

Reinforcing Steel Bars and Rods; *G, RO*

Masonry Cement; *G, RO*

Mortar Coloring; *G, RO*

Admixtures for Masonry Mortar; *G, RO*

Admixtures for Grout; *G, RO*

Certificates of compliance stating that the materials meet the specified requirements.

SD-08 Manufacturer's Instructions

Masonry Cement; *G, RO*

When masonry cement is used, submit the manufacturer's printed instructions on proportions of water and aggregates and on mixing to obtain the type of mortar required.

1.3 SAMPLE MASONRY PANELS

After material samples are approved and prior to starting masonry work, a sample masonry panel shall be constructed for each type and color of masonry required. At least 48 hours prior to constructing the sample panel or panels, the Contractor shall submit written notification to the Contracting Officer's Representative. Sample panels shall not be built in, or as part of the structure, but shall be located where directed.

1.3.1 Configuration

Panels shall be L-shaped or otherwise configured to represent all of the wall elements. Panels shall be of the size necessary to demonstrate the acceptable level of workmanship for each type of masonry represented on the project. The minimum size of a straight panel or a leg of an L-shaped panel shall be 2.5 m long by 1.8 m high.

1.3.2 Composition

Panels shall show full color range, texture, and bond pattern of the masonry work. The Contractor's method for mortar joint tooling; grouting of reinforced vertical cores, collar joints, bond beams, and lintels; positioning, securing, and lapping of reinforcing steel; positioning and lapping of joint reinforcement (including prefabricated corners); and cleaning of masonry work shall be demonstrated during the construction of the panels. Installation or application procedures for anchors, wall ties, CMU control joints, flashing, shall be shown in the sample panels. The

panels shall contain a masonry bonded corner that includes a bond beam corner. Panels shall show installation of electrical boxes and conduit. Panels that represent reinforced masonry shall contain a 600 by 600 mm opening placed at least 600 mm above the panel base and 600 mm away from all free edges, corners, and control joints. Required reinforcing shall be provided around this opening as well as at wall corners and control joints.

1.3.3 Construction Method

Where masonry is to be grouted, the Contractor shall demonstrate and receive approval on the method that will be used to bring up the masonry wythes; support the reinforcing bars; and grout cells, bond beams, lintels, and collar joints using the requirements specified herein. If sealer is specified to be applied to the masonry units, sealer shall be applied to the sample panels. Panels shall be built on a properly designed concrete foundation.

1.3.4 Usage

The completed panels shall be used as the standard of workmanship for the type of masonry represented. Masonry work shall not commence until the sample panel for that type of masonry construction has been completed and approved. Panels shall be protected from the weather and construction operations until the masonry work has been completed and approved. After completion of the work, the sample panels, including all foundation concrete, shall become the property of the Contractor and shall be removed from the construction site.

1.4 DELIVERY, HANDLING, AND STORAGE

Materials shall be delivered, handled, stored, and protected to avoid chipping, breakage, and contact with soil or contaminating material.

1.4.1 Masonry Units

Concrete masonry units shall be covered or protected from inclement weather. Store Type II, concrete masonry units at the site for a minimum of 28 days for air cured units, 10 days for atmospheric steam or water cured units, and 3 days for units cured with steam at a pressure of 800 to 1000 kPa and at a temperature of 180 to 185 degrees C for at least 5 hours. Protect moisture controlled units (Type I) from rain and ground water.

1.4.2 Reinforcement, Anchors, and Ties

Steel reinforcing bars, coated anchors, ties, and joint reinforcement shall be stored above the ground. Steel reinforcing bars and uncoated ties shall be free of loose mill scale and rust.

1.4.3 Cementitious Materials, Sand and Aggregates

Cementitious and other packaged materials shall be delivered in unopened containers, plainly marked and labeled with manufacturers' names and brands. Cementitious material shall be stored in dry, weathertight enclosures or be completely covered. Cement shall be handled in a manner that will prevent the inclusion of foreign materials and damage by water or dampness. Sand and aggregates shall be stored in a manner to prevent contamination or segregation.

1.5 MASONRY WORK: STRUCTURAL MASONRY

1.5.1 Special Inspection

A qualified masonry inspector approved by the Contracting Officer shall perform inspection of the masonry work. Minimum qualifications for the masonry inspector shall be 5 years of reinforced masonry inspection experience or acceptance by a State, municipality, or other governmental body having a program of examining and certifying inspectors for reinforced masonry construction. The masonry inspector shall be present during preparation of masonry prisms, sampling and placing of masonry units, placement of reinforcement (including placement of dowels in footings and foundation walls), inspection of grout space, immediately prior to closing of cleanouts, and during grouting operations. The masonry inspector shall assure Contractor compliance with the drawings and specifications. The masonry inspector shall keep a complete record of all inspections and shall submit daily written reports to the Quality Control Supervisory Representative reporting the quality of masonry construction.

1.6 QUALITY ASSURANCE

1.6.1 Appearance

Bricks shall be manufactured at one time and from the same batch. Blend all brick to produce a uniform appearance when installed. An observable "banding" or "layering" of colors or textures caused by improperly mixed brick is unacceptable.

1.6.2 Testing

Masonry strength shall be determined in accordance with ACI 530.1; submit test reports on three prisms in accordance with ASTM E 447, Method B modified as specified in ACI 530.1. The cost of testing shall be paid by the Contractor.

1.6.3 Spare Vibrator

Maintain at least one spare vibrator on site at all times.

1.6.4 Bracing and Scaffolding

Provide bracing and scaffolding necessary for masonry work. Design bracing to resist wind pressure as required by local code.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

The source of materials which will affect the appearance of the finished work shall not be changed after the work has started except with Contracting Officer's approval. The Contractor has the option to use either hard metric or substitute inch-pound (soft-metric) CMU products. If the Contractor decides to substitute inch-pound CMU products, the following additional requirements shall be met:

- a. The metric dimensions indicated on the drawings shall not be altered to accommodate inch-pound CMU products either horizontally or vertically. The 100 mm building module shall be maintained,***

except for the CMU products themselves.

ab. Mortar joint widths shall be maintained as specified.

cb. Rebars shall not be cut, bent or eliminated to fit into the inch-pound CMU products module.

ed. Inch-pound CMU products shall not be reduced in size by more than one-third (1/3) in height and one-half (1/2) in length. Cut CMU products shall not be located at ends of walls, corners, and other openings.

de. Cut, exposed CMU products shall be held to a minimum and located where they would have the least impact on the architectural aesthetic goals of the facility.

f. Other building components, built into the CMU products, such as window frames, door frames, louvers, grilles, fire dampers, etc., that are required to be metric, shall remain metric.

eg. Additional metric guidance shall conform to Section 01415 METRIC MEASUREMENTS.

2.2 CONCRETE MASONRY UNITS (CMU)

Cement shall have a low alkali content and be of one brand. Units shall be of modular dimensions and air, water, or steam cured. ; Exposed surfaces of units shall be smooth and of uniform texture. Concrete masonry units shall have water-repellant admixture added during manufacture.

- a. Hollow Load-Bearing Units: ASTM C 90, Type I , made with normal weight aggregate. Provide load-bearing units for load-bearing walls, and shear walls.
- b. Hollow Non-Load-Bearing Units: ASTM C 129, Type I , made with normal weight aggregate. Load-bearing units may be provided in lieu of non-load-bearing units.

2.2.1 Aggregates

Lightweight aggregates and blends of lightweight and heavier aggregates in proportions used in producing the units, shall comply with the following requirements when tested for stain-producing iron compounds in accordance with ASTM C 641: by visual classification method, the iron stain deposited on the filter paper shall not exceed the "light stain" classification.

2.2.2 Kinds and Shapes

Units shall be modular in size and shall include closer, jamb, header, lintel, and bond beam units and special shapes and sizes to complete the work as indicated. Units used in exposed masonry surfaces in any one building shall have a uniform fine to medium texture and a uniform color.

2.3 PRECAST CONCRETE ITEMS

Trim, lintels, copings, splashblocks and door sills shall be factory-made

units from a plant regularly engaged in producing precast concrete units. Unless otherwise indicated, concrete shall be 20 MPa minimum conforming to Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE using 13 mm to No. 4 nominal-size coarse aggregate, and minimum reinforcement shall be the reinforcement required for handling of the units. Clearance of 20 mm shall be maintained between reinforcement and faces of units. Unless precast-concrete items have been subjected during manufacture to saturated-steam pressure of at least 827 kPa for at least 5 hours, the items, after casting, shall be either damp-cured for 24 hours or steam-cured and shall be aged under cover for 28 days or longer. Cast-concrete members weighing over 35 kg shall have built-in loops of galvanized wire or other approved provisions for lifting and anchoring. Units shall have beds and joints at right angles to the face, with sharp true arises and shall be cast with drip grooves on the underside where units overhang walls. Exposed-to-view surfaces shall be free of surface voids, spalls, cracks, and chipped or broken edges. Precast units exposed-to-view shall be of uniform appearance and color. Unless otherwise specified, units shall have a smooth dense finish. Prior to use, each item shall be wetted and inspected for crazing. Items showing evidence of dusting, spalling, crazing, or having surfaces treated with a protective coating will be rejected.

2.3.1 Sills and Copings

Sills and copings shall be cast with washes. Sills for windows having mullions shall be cast in sections with head joints at mullions and a 6 mm allowance for mortar joints. The ends of sills, except a 20 mm wide margin at exposed surfaces, shall be roughened for bond. Reinforce sills with not less than two No. 15 bars.

2.3.2 Splash Blocks

Splash blocks shall be as detailed. Reinforcement shall be the manufacturer's standard.

2.4 MORTAR FOR STRUCTURAL MASONRY

ASTM C 270, Type N S. Strength (f'm) as indicated. Test in accordance with ASTM C 780. Use Type I portland cement. Do not use admixtures containing chlorides. When structural reinforcement is incorporated, maximum air-content shall be 12 percent in cement-lime mortar and 18 percent in masonry cement mortar.

2.5 MASONRY MORTAR

Mortar Type S shall conform to the proportion specification of ASTM C 270 except Type S cement-lime mortar proportions shall be 1 part cement, 1/2 part lime and 4-1/2 parts aggregate; Type S mortar shall be used for—~~Type S for~~ all masonry work; except where higher compressive strength is indicated on structural drawings. When masonry cement ASTM C 91 is used the maximum air content shall be limited to 12 percent and performance equal to cement-lime mortar shall be verified. Verification of masonry cement performance shall be based on ASTM C 780 and ASTM C 1072. Pointing mortar shall contain ammonium stearate, or aluminum tri-stearate, or calcium stearate in an amount equal to 3 percent by weight of cement used. Cement shall have a low alkali content and be of one brand. Aggregates

shall be from one source.

2.5.1 Cement

Portland cement shall conform to ASTM C 150, Type I. Masonry cement shall conform to ASTM C 91, Type S. Containers shall bear complete instructions for proportioning and mixing to obtain the required types of mortar.

2.5.2 Pre-Mixed Mortar

Pre-mixed mortar shall conform to ASTM C 1142, Type RS.

2.5.3 Sand and Water

Sand shall conform to ASTM C 144. Water shall be clean, potable, and free from substances which could adversely affect the mortar.

2.6 WATER-REPELLANT ADMIXTURE

Polymeric type formulated to reduce porosity and water transmission. Construct panels of masonry units conforming to ASTM C 744 and mortar which contain the water-repellant admixture. When tested in accordance with ASTM C 1072, such panels shall have flexural strength not less than that specified or indicated. When tested in accordance with ASTM E 514, panels shall exhibit no water visible on back of test panel and no leaks through the panel after 24 hours, and not more than 25 percent of wall area shall be damp after 72 hours.

2.7 GROUT AND READY-MIXED GROUT

Grout shall conform to ASTM C 476, fine . Cement used in grout shall have a low alkali content. Grout slump shall be between 200 and 250 mm. Minimum grout strength shall be 14 MPa in 28 days, as tested by ASTM C 1019.

Grout shall be used subject to the limitations of Table III. Proportions shall not be changed and materials with different physical or chemical characteristics shall not be used in grout for the work unless additional evidence is furnished that the grout meets the specified requirements. Ready-Mixed grout shall conform to ASTM C 94/C 94M.

2.7.1 Admixtures for Grout

In cold weather, a non-chloride based accelerating admixture may be used subject to approval; accelerating admixture shall be non-corrosive, shall contain less than 0.2 percent chlorides, and shall conform to ASTM C 494/C 494M, Type C. In general, air-entrainment, anti-freeze or chloride admixtures shall not be used except as approved by the Contracting Officer.

2.7.2 Grout Barriers

Grout barriers for vertical cores shall consist of fine mesh wire, fiberglass, or expanded metal.

2.8 ANCHORS, TIES, AND BAR POSITIONERS

Anchors and ties shall be fabricated without drips or crimps and shall be zinc-coated in accordance with ASTM A 153/A 153M, Class B-2. Steel wire used for anchors and ties shall be fabricated from steel wire conforming to ASTM A 82. Anchors and ties shall be sized to provide a minimum of 16 mm mortar cover from either face.

~~2.11.3 Dovetail Anchors~~

~~Dovetail anchors shall be of the flexible wire type, 5 mm diameter zinc coated steel wire, triangular shaped, and attached to a 12 gauge or heavier steel dovetail section. These anchors shall be used for anchorage of veneer wythes or composite wall facings extending over the face of concrete columns, beams, or walls. Cells within vertical planes of these anchors shall be filled solid with grout for full height of walls or partitions, or solid units may be used. Dovetail slots are specified in Section 03300 CAST IN PLACE STRUCTURAL CONCRETE.~~

2.8.1 Adjustable Anchors

Adjustable anchors shall be 5 mm diameter steel wire, triangular-shaped. Anchors attached to steel shall be 8 mm diameter steel bars placed to provide 2 mm (1/16 inch) play between flexible anchors and structural steel members. Spacers shall be welded to rods and columns. Equivalent welded-on steel anchor rods or shapes standard with the flexible-anchor manufacturer may be furnished when approved. Welds shall be cleaned and given one coat of zinc-rich touch up paint.

2.8.2 Bar Positioners

Bar positioners, used to prevent displacement of reinforcing bars during the course of construction, shall be factory fabricated from 9 gauge steel wire or equivalent, and coated with a hot-dip galvanized finish. Not more than one wire shall cross the cell.

2.9 JOINT REINFORCEMENT

Joint reinforcement shall be factory fabricated from steel wire conforming to ASTM A 82, welded construction. Tack welding will not be acceptable in reinforcement used for wall ties. Wire shall have zinc coating conforming to ASTM A 153/A 153M, Class B-2. All wires shall be a minimum of 9 gauge. Reinforcement shall be ladder type design, having one longitudinal wire in the mortar bed of each face shell for hollow units and one wire for solid units. Joint reinforcement shall be placed a minimum of 16 mm cover from either face. The distance between crosswires shall not exceed 400 mm. Joint reinforcement for straight runs shall be furnished in flat sections not less than 3 m long. Joint reinforcement shall be provided with factory formed corners and intersections. If approved for use, joint reinforcement may be furnished with adjustable wall tie features.

2.10 REINFORCING STEEL BARS AND RODS

Reinforcing steel bars and rods shall conform to ASTM A 615/A 615M, Grade 60 or ASTM A 616/A 616M.

2.11 CONTROL JOINT KEYS

Control joint keys shall be a factory fabricated solid section of natural or synthetic rubber (or combination thereof) conforming to ASTM D 2000 or polyvinyl chloride conforming to ASTM D 2287. The material shall be resistant to oils and solvents. The control joint key shall be provided with a solid shear section not less than 16 mm thick and 10 mm thick flanges, with a tolerance of plus or minus 2 mm (1/16 inch). The control joint key shall fit neatly, but without forcing, in masonry unit jamb sash grooves. The control joint key shall be flexible at a temperature of minus

34 degrees C after five hours exposure, and shall have a durometer hardness of not less than 70 when tested in accordance with ASTM D 2240.

2.12 EXPANSION-JOINT MATERIALS

Backer rod and sealant shall be adequate to accommodate joint compression equal to 50 percent of the width of the joint. The backer rod shall be compressible rod stock of polyethylene foam, polyurethane foam, butyl rubber foam, or other flexible, nonabsorptive material as recommended by the sealant manufacturer. Sealant shall conform to Section 07900AJOINT SEALING.

2.13 FLASHING

Flashing shall be as specified in Section 07600 SHEET METALWORK, GENERAL. Provide one of the following types: ***except that flashing indicated to terminate in reglets shall be metal or coated-metal flashing and except that the material shall be one which is not adversely affected by dampproofing material.***

- a. Coated-Copper Flashing: 0.2 kg , electrolytic copper sheet, uniformly coated on both sides with acidproof, alkaliproof, elastic bituminous compound. Factory apply coating to a weight of not less than 1.8 kg per square meter (approximately 0.9 kg per square meter on each side).
- b. Copper or Stainless Steel Flashing: Copper, ASTM B 370, minimum 450 g weight; stainless steel, ASTM A 167, Type 301, 302, 304, or 316, 4 mm thick, No. 2D finish. Provide with factory-fabricated deformations that mechanically bond flashing against horizontal movement in all directions. Deformations shall consist of dimples, diagonal corrugations, or a combination of dimples and transverse corrugations.
- c. Reinforced Membrane Flashing: Polyester film core with a reinforcing fiberglass scrim bonded to one side. The membrane shall be impervious to moisture, flexible, and not affected by caustic alkalis. The material, after being exposed for not less than 1/2 hour to a temperature of 0 degrees C , shall show no cracking when, at that temperature, it is bent 180 degrees over a 2 mm diameter mandrel and then bent at the same point over the same size mandrel in the opposite direction 360 degrees.

2.14 WEEP HOLE VENTILATORS

Weephole ventilators shall be prefabricated aluminum, plastic or wood blocking sized to form the proper size opening in head joints. Provide aluminum and plastic inserts with grill or screen-type openings designed to allow the passage of moisture from cavities and to prevent the entrance or insects. Ventilators shall be sized to match modular construction with a standard 10 mm 10 mm mortar joint.

PART 3 EXECUTION

3.1 PREPARATION

Prior to start of work, masonry inspector shall verify the applicable conditions as set forth in ACI 530.1, inspection. The Contracting Officer will serve as inspector or will select a masonry inspector.

3.1.1 Hot Weather Installation

The following precautions shall be taken if masonry is erected when the ambient air temperature is more than 37 degrees C in the shade and the relative humidity is less than 50 percent or the ambient air temperature exceeds 32 degrees C and the wind velocity is more than 13 km/h . All masonry materials shall be shaded from direct sunlight; mortar beds shall be spread no more than 1.2 m ahead of masonry; masonry units shall be set within one minute of spreading mortar; and after erection, masonry shall be protected from direct exposure to wind and sun for 48 hours.

3.1.2 Cold Weather Installation

Before erecting masonry when ambient temperature or mean daily air temperature falls below 4 degrees C or temperature of masonry units is below 4 degrees C , a written statement of proposed cold weather construction procedures shall be submitted for approval. The following precautions shall be taken during all cold weather erection.

3.1.2.1 Protection

Ice or snow formed on the masonry bed shall be thawed by the application of heat. Heat shall be applied carefully until the top surface of the masonry is dry to the touch. Sections of masonry deemed frozen and damaged shall be removed before continuing construction of those sections.

- a. Air Temperature 4 to 0 degrees C . Sand or mixing water shall be heated to produce mortar temperatures between 4 and 49 degrees C .
- b. Air Temperature 0 to minus 4 degrees C . Sand and mixing water shall be heated to produce mortar temperatures between 4 and 49 degrees C . Temperature of mortar on boards shall be maintained above freezing.
- c. Air Temperature minus 4 to minus 7 degrees C . Sand and mixing water shall be heated to provide mortar temperatures between 4 and 49 degrees C . Temperature of mortar on boards shall be maintained above freezing. Sources of heat shall be used on both sides of walls under construction. Windbreaks shall be employed when wind is in excess of 24 km/hour .
- d. Air Temperature minus 7 degrees C and below. Sand and mixing water shall be heated to provide mortar temperatures between 4 and 49 degrees C . Enclosure and auxiliary heat shall be provided to maintain air temperature above 0 degrees C . Temperature of units when laid shall not be less than minus 7 degrees C .

3.1.2.2 Completed Masonry and Masonry Not Being Worked On

- a. Mean daily air temperature 4 to 0 degrees C . Masonry shall be protected from rain or snow for 24 hours by covering with weather-resistive membrane.
- b. Mean daily air temperature 0 to minus 4 degrees C . Masonry shall be completely covered with weather-resistant membrane for 24 hours.
- c. Mean Daily Air Temperature minus 4 to minus 7 degrees C . Masonry shall be completely covered with insulating blankets or equally

protected for 24 hours.

- d. Mean Daily Temperature minus 7 degrees C and Below. Masonry temperature shall be maintained above 0 degrees C for 24 hours by enclosure and supplementary heat, by electric heating blankets, infrared heat lamps, or other approved methods.

3.1.3 Stains

Protect exposed surfaces from mortar and other stains. When mortar joints are tooled, remove mortar from exposed surfaces with fiber brushes and wooden paddles. Protect base of walls from splash stains by covering adjacent ground with sand, sawdust, or polyethylene.

3.1.4 Loads

Do not apply uniform loads for at least 12 hours or concentrated loads for at least 72 hours after masonry is constructed. Provide temporary bracing as required.

3.1.5 Surfaces

Surfaces on which masonry is to be placed shall be cleaned of laitance, dust, dirt, oil, organic matter, or other foreign materials and shall be slightly roughened to provide a surface texture with a depth of at least 3 mm. Sandblasting shall be used, if necessary, to remove laitance from pores and to expose the aggregate.

3.2 LAYING MASONRY UNITS

Coordinate masonry work with the work of other trades to accommodate built-in items and to avoid cutting and patching. Masonry units shall be laid in running bond pattern. Facing courses shall be level with back-up courses, unless the use of adjustable ties has been approved in which case the tolerances shall be plus or minus 13 mm. Each unit shall be adjusted to its final position while mortar is still soft and plastic. Units that have been disturbed after the mortar has stiffened shall be removed, cleaned, and relaid with fresh mortar. Air spaces, cavities, chases, expansion joints, and spaces to be grouted shall be kept free from mortar and other debris. Units used in exposed masonry surfaces shall be selected from those having the least amount of chipped edges or other imperfections detracting from the appearance of the finished work. Vertical joints shall be kept plumb. Units being laid and surfaces to receive units shall be free of water film and frost. Solid units shall be laid in a nonfurrowed full bed of mortar. Mortar for veneer wythes shall be beveled and sloped toward the center of the wythe from the cavity side. Units shall be shoved into place so that the vertical joints are tight. Vertical joints of brick and the vertical face shells of concrete masonry units, except where indicated at control, expansion, and isolation joints, shall be completely filled with mortar. Mortar will be permitted to protrude up to 13 mm into the space or cells to be grouted. Means shall be provided to prevent mortar from dropping into the space below. In double wythe construction, the inner wythe may be brought up not more than 400 mm ahead of the outer wythe. Collar joints shall be filled with mortar or grout during the laying of the facing wythe, and filling shall not lag the laying of the facing wythe by more than 200 mm.

3.2.1 Forms and Shores

Provide bracing and scaffolding as required. Design bracing to resist wind pressure as required by local codes. Forms and shores shall be sufficiently rigid to prevent deflections which may result in cracking or other damage to supported masonry and sufficiently tight to prevent leakage of mortar and grout. Supporting forms and shores shall not be removed in less than 10 days.

3.2.2 Reinforced Concrete Masonry Units Walls

Where vertical reinforcement occurs, fill cores solid with grout. Lay units in such a manner as to preserve the unobstructed vertical continuity of cores to be filled. Embed the adjacent webs in mortar to prevent leakage of grout. Remove mortar fins protruding from joints before placing grout. Minimum clear dimensions of vertical cores shall be 50 by 75 mm. Position reinforcing accurately as indicated before placing grout. As masonry work progresses, secure vertical reinforcing in place at vertical intervals not to exceed 160 bar diameters. Use puddling rod or vibrator to consolidate the grout. Minimum clear distance between masonry and vertical reinforcement shall be not less than 12 mm. Unless indicated or specified otherwise, form splices by lapping bars not less than 40 bar diameters and wire tying them together.

3.2.3 Concrete Masonry Units

Units in starting courses on footings, and where cells are to be filled with grout shall be full bedded in mortar under both face shells and webs. Other units shall be full bedded under both face shells. Head joints shall be filled solidly with mortar for a distance in from the face of the unit not less than the thickness of the face shell. Jamb units shall be of the shapes and sizes to conform with wall units. Solid units may be incorporated in the masonry work where necessary to fill out at corners, gable slopes, and elsewhere as approved. Double walls shall be stiffened at wall-mounted plumbing fixtures by use of strap anchors, two above each fixture and two below each fixture, located to avoid pipe runs, and extending from center to center of the double wall. Walls and partitions shall be adequately reinforced for support of wall-hung plumbing fixtures when chair carriers are not specified.

3.2.4 Tolerances

Masonry shall be laid plumb, true to line, with courses level. Bond pattern shall be kept plumb throughout. Corners shall be square unless noted otherwise. Except for walls constructed of prefaced concrete masonry units, masonry shall be laid within the following tolerances (plus or minus unless otherwise noted):

TABLE II

TOLERANCES

Variation from the plumb in the lines
and surfaces of columns, walls and arises

In adjacent masonry units	3 mm
In 3 m	6 mm
In 6 m	10 mm
In 12 m or more	13 mm

TOLERANCES

Variations from the plumb for external corners,
expansion joints, and other conspicuous lines

In 6 m	6 mm
In 12 m or more	13 mm

Variations from the level for exposed lintels,
sills, parapets, horizontal grooves, and other
conspicuous lines

In 6 m	6 mm
In 12 m or more	13 mm

Variation from level for bed joints and top
surfaces of bearing walls

In 3 m	6 mm
In 12 m or more	13 mm

Variations from horizontal lines

In 3 m	6 mm
In 6 m	10 mm
In 12 m or more	13 mm

Variations in cross sectional dimensions of
columns and in thickness of walls

Minus	6 mm
Plus	13 mm

3.2.5 Cutting and Fitting

Full units of the proper size shall be used wherever possible, in lieu of cut units. Cutting and fitting, including that required to accommodate the work of others, shall be done by masonry mechanics using power masonry saws. Concrete masonry units may be wet or dry cut. Wet cut units, before being placed in the work, shall be dried to the same surface-dry appearance as uncut units being laid in the wall. Cut edges shall be clean, true and sharp. Openings in the masonry shall be made carefully so that wall plates, cover plates or escutcheons required by the installation will completely conceal the openings and will have bottoms parallel with the masonry bed joints. Reinforced masonry lintels shall be provided above openings over 300 mm wide for pipes, ducts, cable trays, and other wall penetrations, unless steel sleeves are used.

3.2.6 Jointing

Joints shall be tooled when the mortar is thumbprint hard. Horizontal joints shall be tooled last. Joints shall be brushed to remove all loose and excess mortar. Mortar joints shall be finished as follows:

3.2.6.1 Flush Joints

Joints in concealed masonry surfaces and joints at electrical outlet boxes in wet areas shall be flush cut. Flush cut joints shall be made by cutting off the mortar flush with the face of the wall. Joints in unparged masonry walls below grade shall be pointed tight. Flush joints for architectural units, such as fluted units, shall completely fill both the head and bed joints.

3.2.6.2 Tooled Joints

Joints in exposed exterior and interior masonry surfaces shall be tooled slightly concave. Joints shall be tooled with a jointer slightly larger than the joint width so that complete contact is made along the edges of the unit. Tooling shall be performed so that the mortar is compressed and the joint surface is sealed. Jointer of sufficient length shall be used to obtain a straight and true mortar joint.

3.2.6.3 Door and Window Frame Joints

On the exposed interior side of exterior frames, joints between frames and abutting masonry walls shall be raked to a depth of 10 mm. On the exterior side of exterior frames, joints between frames and abutting masonry walls shall be raked to a depth of 10 mm.

3.2.7 Joint Widths

Joint widths shall be as follows:

3.2.7.1 Concrete Masonry Units

Concrete masonry units shall have 10 mm joints, ~~except for prefaced concrete masonry units.~~

3.2.8 Embedded Items

Spaces around built-in items shall be filled with mortar. Openings around flush-mount electrical outlet boxes in wet locations shall be pointed with mortar. Anchors, ties, wall plugs, accessories, flashing, pipe sleeves and other items required to be built-in shall be embedded as the masonry work progresses. Anchors, ties and joint reinforcement shall be fully embedded in the mortar. Cells receiving anchor bolts and cells of the first course below bearing plates shall be filled with grout.

3.2.9 Unfinished Work

Unfinished work shall be stepped back for joining with new work. Toothing may be resorted to only when specifically approved. Loose mortar shall be removed and the exposed joints shall be thoroughly cleaned before laying new work.

3.2.10 Masonry Wall Intersections

Each course shall be masonry bonded at corners and elsewhere as shown. Masonry walls shall be anchored or tied together at corners and intersections with bond beam reinforcement and prefabricated corner or tee pieces of joint reinforcement as shown.

3.2.11 Partitions

Partitions shall be continuous from floor to underside of floor or roof deck or to the height indicated on the drawings. Where suspended ceilings on both sides of partitions are indicated, the partitions other than those shown to be continuous may be stopped approximately 100 mm above the ceiling level. An isolation joint shall be placed in the intersection between partitions and structural or exterior walls as shown. Cells within vertical plane of ties shall be filled solid with grout for full height of partition. Interior partitions having masonry walls over 100 mm thick shall be tied together with joint reinforcement. Partitions containing joint reinforcement shall be provided with prefabricated pieces at corners and intersections or partitions.

3.3 WEEP HOLES

Wherever through-wall flashing occurs, provide weep holes to drain flashing to exterior. Weep holes shall be provided not more than 600 mm on centers in mortar joints of the exterior wythe above wall flashing, over foundations, bond beams, and any other horizontal interruptions of the cavity. Weep holes shall be formed by placing short lengths of well-greased No. 10, 8 mm, braided cotton sash cord in the mortar and withdrawing the cords after the wall has been completed. Other approved methods may be used for providing weep holes. Weep holes shall be kept free of mortar and other obstructions.

3.4 MORTAR

Mortar shall be mixed in a mechanically operated mortar mixer for at least 3 minutes, but not more than 5 minutes. Measurement of ingredients for mortar shall be by volume. Ingredients not in containers, such as sand, shall be accurately measured by the use of measuring boxes. Water shall be mixed with the dry ingredients in sufficient amount to provide a workable mixture which will adhere to the vertical surfaces of masonry units. Mortar that has stiffened because of loss of water through evaporation shall be retempered by adding water to restore the proper consistency and workability. Mortar that has reached its initial set or that has not been used within 2-1/2 hours after mixing shall be discarded.

3.5 REINFORCING STEEL

Reinforcement shall be cleaned of loose, flaky rust, scale, grease, mortar, grout, or other coating which might destroy or reduce its bond prior to placing grout. Bars with kinks or bends not shown on the drawings shall not be used. Reinforcement shall be placed prior to grouting. Unless otherwise indicated, vertical wall reinforcement shall extend to within 50 mm of tops of walls.

3.5.1 Positioning Bars

Vertical bars shall be accurately placed within the cells at the positions indicated on the drawings. A minimum clearance of 13 mm shall be maintained between the bars and masonry units. Minimum clearance between parallel bars shall be one diameter of the reinforcement. Vertical reinforcing may be held in place using bar positioners located near the ends of each bar and at intermediate intervals of not more than 192 diameters of the reinforcement. Column and pilaster ties shall be wired in position around the vertical steel. Ties shall be in contact with the vertical reinforcement and shall not be placed in horizontal bed joints.

3.5.2 Splices

Bars shall be lapped a minimum of 48 diameters of the reinforcement. Welded or mechanical connections shall develop at least 125 percent of the specified yield strength of the reinforcement.

3.6 PLACING GROUT

Cells containing reinforcing bars shall be filled with grout. Hollow masonry units in walls or partitions supporting plumbing, heating, or other mechanical fixtures, voids at door and window jambs, and other indicated spaces shall be filled solid with grout. Cells under lintel bearings on each side of openings shall be filled solid with grout for full height of openings. Walls below grade, lintels, and bond beams shall be filled solid with grout. Units other than open end units may require grouting each course to preclude voids in the units. Grout not in place within 1-1/2 hours after water is first added to the batch shall be discarded. Sufficient time shall be allowed between grout lifts to preclude displacement or cracking of face shells of masonry units. If blowouts, flowouts, misalignment, or cracking of face shells should occur during construction, the wall shall be torn down and rebuilt.

3.6.1 Vertical Grout Barriers for Fully Grouted Walls

Grout barriers shall be provided not more than 10 m apart, or as required, to limit the horizontal flow of grout for each pour.

3.6.2 Horizontal Grout Barriers

Grout barriers shall be embedded in mortar below cells of hollow units receiving grout.

3.6.3 Grout Holes and Cleanouts

3.6.3.1 Grout Holes

Grouting holes shall be provided in slabs, spandrel beams, and other in-place overhead construction. Holes shall be located over vertical reinforcing bars or as required to facilitate grout fill in bond beams. Additional openings spaced not more than 400 mm on centers shall be provided where grouting of all hollow unit masonry is indicated. Openings shall not be less than 100 mm in diameter or 75 by 100 mm in horizontal dimensions. Upon completion of grouting operations, grouting holes shall be plugged and finished to match surrounding surfaces.

3.6.3.2 Cleanouts for Hollow Unit Masonry Construction

Cleanout holes shall be provided at the bottom of every pour in cores containing vertical reinforcement when the height of the grout pour exceeds 1.5 m. Where all cells are to be grouted, cleanout courses shall be constructed using bond beam units in an inverted position to permit cleaning of all cells. Cleanout holes shall be provided at a maximum spacing of 800 mm where all cells are to be filled with grout. A new series of cleanouts shall be established if grouting operations are stopped for more than 4 hours. Cleanouts shall not be less than 75 by 100 mm openings cut from one face shell. Manufacturer's standard cutout units may be used at the Contractor's option. Cleanout holes shall not be closed until masonry work, reinforcement, and final cleaning of the grout spaces have been completed and inspected. For walls which will be exposed to

view, cleanout holes shall be closed in an approved manner to match surrounding masonry.

3.6.4 Grouting Equipment

3.6.4.1 Grout Pumps

Pumping through aluminum tubes will not be permitted. Pumps shall be operated to produce a continuous stream of grout without air pockets, segregation, or contamination. Upon completion of each day's pumping, waste materials and debris shall be removed from the equipment, and disposed of outside the masonry.

3.6.4.2 Vibrators

Internal vibrators shall maintain a speed of not less than 5,000 impulses per minute when submerged in the grout. At least one spare vibrator shall be maintained at the site at all times. Vibrators shall be applied at uniformly spaced points not further apart than the visible effectiveness of the machine. Duration of vibration shall be limited to time necessary to produce satisfactory consolidation without causing segregation.

3.6.5 Grout Placement

Masonry shall be laid to the top of a pour before placing grout. Grout shall not be placed in hollow unit masonry until mortar joints have set for at least 24 hours. Grout shall be placed using a hand bucket, concrete hopper, or grout pump to completely fill the grout spaces without segregation of the aggregates. Vibrators shall not be inserted into lower pours that are in a semi-solidified state. The height of grout pours and type of grout used shall be limited by the dimensions of grout spaces as indicated in Table III. Low-lift grout methods may be used on pours up to and including 1.5 m in height. High-lift grout methods shall be used on pours exceeding 1.5 m in height.

3.6.5.1 Low-Lift Method

Grout shall be placed at a rate that will not cause displacement of the masonry due to hydrostatic pressure of the grout. Mortar protruding more than 13 mm into the grout space shall be removed before beginning the grouting operation. Grout pours 300 mm or less in height shall be consolidated by mechanical vibration or by puddling. Grout pours over 300 mm in height shall be consolidated by mechanical vibration and reconsolidated by mechanical vibration after initial water loss and settlement has occurred. Vibrators shall not be inserted into lower pours that are in a semi-solidified state. Low-lift grout shall be used subject to the limitations of Table III.

3.6.5.2 High-Lift Method

Mortar droppings shall be cleaned from the bottom of the grout space and from reinforcing steel. Mortar protruding more than 6 mm into the grout space shall be removed by dislodging the projections with a rod or stick as the work progresses. Reinforcing, bolts, and embedded connections shall be rigidly held in position before grouting is started. CMU units shall not be pre-wetted. Grout, from the mixer to the point of deposit in the grout space shall be placed as rapidly as practical by pumping and placing methods which will prevent segregation of the mix and cause a minimum of grout splatter on reinforcing and masonry surfaces not being immediately

encased in the grout lift. The individual lifts of grout shall be limited to 1.2 m in height. The first lift of grout shall be placed to a uniform height within the pour section and vibrated thoroughly to fill all voids. This first vibration shall follow immediately behind the pouring of the grout using an approved mechanical vibrator. After a waiting period sufficient to permit the grout to become plastic, but before it has taken any set, the succeeding lift shall be poured and vibrated 300 to 450 mm into the preceding lift. If the placing of the succeeding lift is going to be delayed beyond the period of workability of the preceding, each lift shall be reconsolidated by reworking with a second vibrator as soon as the grout has taken its settlement shrinkage. The waiting, pouring, and reconsolidation steps shall be repeated until the top of the pour is reached. The top lift shall be reconsolidated after the required waiting period. The high-lift grouting of any section of wall between vertical grout barriers shall be completed to the top of a pour in one working day unless a new series of cleanout holes is established and the resulting horizontal construction joint cleaned. High-lift grout shall be used subject to the limitations in Table III.

TABLE III

POUR HEIGHT AND TYPE OF GROUT FOR VARIOUS GROUT SPACE DIMENSIONS

Maximum Grout Pour Height (m) (4)	Minimum Dimensions of the Total Clear Areas Within Grout Spaces and Cells (mm) (1,2)			
	Grout Type	Grouting Procedure	Multiwythe Masonry (3)	Hollow-unit Masonry
0.3	Fine	Low Lift	20	40 x 50
1.5	Fine	Low Lift	50	50 x 75
2.4	Fine	High Lift	50	50 x 75
3.6	Fine	High Lift	65	65 x 75
7.3	Fine	High Lift	75	75 x 75
0.3	Coarse	Low Lift	40	40 x 75
1.5	Coarse	Low Lift	50	65 x 75
2.4	Coarse	High Lift	50	75 x 75
3.6	Coarse	High Lift	65	75 x 75
7.3	Coarse	High Lift	75	75 x 100

Notes:

- (1) The actual grout space or cell dimension must be larger than the sum of the following items:
 - a) The required minimum dimensions of total clear areas given in the table above;
 - b) The width of any mortar projections within the space;
 - c) The horizontal projections of the diameters of the horizontal reinforcing bars within a cross section of the grout space or cell.
- (2) The minimum dimensions of the total clear areas shall be made up of one or more open areas, with at least one area being 20 mm or greater in width.
- (3) For grouting spaces between masonry wythes.
- (4) Where only cells of hollow masonry units containing reinforcement are grouted, the maximum height of the pour shall not exceed the

distance between horizontal bond beams.

3.7 BOND BEAMS

Bond beams shall be filled with grout and reinforced as indicated on the drawings. Grout barriers shall be installed under bond beam units to retain the grout as required. Reinforcement shall be continuous, including around corners, except through control joints or expansion joints, unless otherwise indicated on the drawings. Where splices are required for continuity, reinforcement shall be lapped 48 bar diameters. A minimum clearance of 13 mm shall be maintained between reinforcement and interior faces of units.

3.8 CONTROL JOINTS

Control joints shall be provided as indicated and shall be constructed by using sash jamb units with control joint key in accordance with the details shown on the drawings. Sash jamb units shall have a 19 by 19 mm groove near the center at end of each unit. The vertical mortar joint at control joint locations shall be continuous, including through all bond beams. This shall be accomplished by utilizing half blocks in alternating courses on each side of the joint. The control joint key shall be interrupted in courses containing continuous bond beam steel. In single wythe exterior masonry walls, the exterior control joints shall be raked to a depth of 20 mm; backer rod and sealant shall be installed in accordance with Section 07900A JOINT SEALING. Exposed interior control joints shall be raked to a depth of 6 mm. Concealed control joints shall be flush cut.

3.9 SHELF ANGLES

Shelf angles shall be adjusted as required to keep the masonry level and at the proper elevation. Shelf angles shall be galvanized. Shelf angles shall be provided in sections not longer than 3 m and installed with a 6 mm gap between sections. Shelf angles shall be mitered and welded at building corners with each angle not shorter than 1.2 m, unless limited by wall configuration.

3.10 LINTELS

3.10.1 Masonry Lintels

Masonry lintels shall be constructed with lintel units filled solid with grout in all courses and reinforced with a minimum of two No. 4 bars in the bottom course unless otherwise indicated on the drawings. Lintel reinforcement shall extend beyond each side of masonry opening 40 bar diameters or 600 mm, whichever is greater. Reinforcing bars shall be supported in place prior to grouting and shall be located 13 mm above the bottom inside surface of the lintel unit.

3.11 ~~3.15~~ **SILLS AND COPINGS**

Sills and copings shall be set in a full bed of mortar with faces plumb and true.

3.12 ANCHORAGE TO CONCRETE AND STRUCTURAL STEEL

3.12.1 Anchorage to Structural Steel

Masonry shall be anchored to vertical structural steel framing with

adjustable steel wire anchors spaced not over 400 mm on centers vertically, and if applicable, not over 600 mm on centers horizontally.

3.13 ~~3.14~~ **SPLASH BLOCKS**

Splash blocks shall be as detailed. Reinforcement shall be the manufacturer's standard.

3.14 POINTING AND CLEANING

After mortar joints have attained their initial set, but prior to hardening, mortar and grout daubs or splashes shall be completely removed from masonry-unit surfaces that will be exposed or painted. Before completion of the work, defects in joints of masonry to be exposed or painted shall be raked out as necessary, filled with mortar, and tooled to match existing joints. Immediately after grout work is completed, scum and stains which have percolated through the masonry work shall be removed using a high pressure stream of water and a stiff bristled brush. Masonry surfaces shall not be cleaned, other than removing excess surface mortar, until mortar in joints has hardened. Masonry surfaces shall be left clean, free of mortar daubs, dirt, stain, and discoloration, including scum from cleaning operations, and with tight mortar joints throughout. Metal tools and metal brushes shall not be used for cleaning.

3.14.1 Concrete Masonry Unit

Exposed concrete masonry units shall be dry-brushed at the end of each day's work and after any required pointing, using stiff-fiber bristled brushes.

3.15 BEARING PLATES

Bearing plates for beams, joists, joist girders and similar structural members shall be set to the proper line and elevation with damp-pack bedding mortar, except where non-shrink grout is indicated. Bedding mortar and non-shrink grout shall be as specified in Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE.

3.16 PROTECTION

Facing materials shall be protected against staining. Top of walls shall be covered with nonstaining waterproof covering or membrane when work is not in progress. Covering of the top of the unfinished walls shall continue until the wall is waterproofed with a complete roof or parapet system. Covering shall extend a minimum of 600 mm down on each side of the wall and shall be held securely in place. Before starting or resuming, top surface of masonry in place shall be cleaned of loose mortar and foreign material.

3.17 TEST REPORTS

3.17.1 Field Testing of Mortar

At least three specimens of mortar shall be taken each day. A layer of mortar 13 to 16 mm thick shall be spread on the masonry units and allowed to stand for one minute. The specimens shall then be prepared and tested for compressive strength in accordance with ASTM C 780.

3.17.2 Field Testing of Grout

Field sampling and testing of grout shall be in accordance with the applicable provisions of ASTM C 1019. A minimum of three specimens of grout per day shall be sampled and tested. Each specimen shall have a minimum ultimate compressive strength of 13.8 MPa at 28 days.

3.18 SPECIAL INSPECTION AND TESTING FOR SEISMIC-RESISTING SYSTEMS

Special inspections and testing for seismic-resisting systems and components shall be done in accordance with Section 01452A SPECIAL INSPECTION FOR SEISMIC-RESISTING SYSTEMS.

-- End of Section --

FIRST FLOOR INTERIOR FINISH SCHEDULE

FIRST FLOOR INTERIOR FINISH SCHEDULE																			
RM. NO.	ROOM NAME	FLOOR	BASE	WAINSCOT		WALLS						CEILING		CABINETRY		DOORS	TRIM	REMARKS	
				MATERIAL	HEIGHT	NORTH	COLOR	EAST	COLOR	SOUTH	COLOR	WEST	COLOR	MATERIAL	COLOR				HEIGHT
100	KITCHEN	SV	SV	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P1	P2	2400	SS	S1	P3	SS, MB
101	MANAGER'S OFFICE	CP	RB	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P1	AC1	2700	---	S1	P3	
102	SUPPLY STORAGE	SV	SV	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2700	---	S1	SHELVING
103	JAN.	CT	CT	1200	1200	GWB	P1	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2400	---	S1	SHELVING
104	MEN	CT	CT	1200	1200	GWB	P1	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2400	---	S1	---
105	WOMEN	CT	CT	1200	1200	GWB	P1	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2400	---	S1	---
106	MULTIPURPOSE SPACE	SV	SV	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P1	AC	3050	---	S1,P3,FF	P3	---
107	BULK STORAGE	CONC	EXP	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2700	---	P3	WM
108	MECHANICAL	CONC	EXP	---	---	CMU	P1	CMU	P1	CMU	P1	CMU	P1	EXP	---	---	P3	P3	---
109	ELEV. SHAFT	CONC	EXP	---	---	GWB	---	GWB	---	GWB	---	GWB	---	EXP	---	---	SSTL	SSTL	SEE NOTE 2 FOR ELEV CAB FINISHES
110	ELEV. EQUIP.	CONC	EXP	---	---	CMU	---	CMU	---	CMU	---	CMU	---	GWB	2700	---	SSTL	SSTL	---
111	COMM	CONC	EXP	---	---	CMU	P1	CMU	P1	CMU	P1	CMU	P1	GWB	2700	---	P3	P3	---
112	ELEC	CONC	EXP	---	---	CMU	P1	CMU	P1	CMU	P1	CMU	P1	GWB	P2	2700	---	P3	---
113	STAIR 1	CONC	EXP	---	---	CMU	P1	CMU	P1	CMU	P1	CMU	P1	EXP	P2	VARIABLES	---	---	METAL RAIL -- TO MATCH MED. BRONZE
114	STAIR 2	CONC	EXP	---	---	CMU	P1	CMU	P1	CMU	P1	CMU	P1	EXP	VARIABLES	---	---	---	METAL RAIL -- TO MATCH MED. BRONZE
115	STAIR 3	CONC	EXP	---	---	CMU	P1	CMU	P1	CMU	P1	CMU	P1	EXP	VARIABLES	---	---	---	METAL RAIL -- TO MATCH MED. BRONZE

SECOND FLOOR INTERIOR FINISH SCHEDULE

SECOND FLOOR INTERIOR FINISH SCHEDULE																		
RM NO.	ROOM NAME	FLOOR	BASE	WAINSCOT		WALLS						CEILING		CABINETRY		DOORS	TRIM	REMARKS
				MATERIAL	HEIGHT	NORTH	COLOR	EAST	COLOR	SOUTH	COLOR	WEST	COLOR	MATERIAL	COLOR			
200	BULK STORAGE	CONC	EXP	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2700	---	SSTL	SSTL	WM
201	ELEV. SHAFT	CONC	EXP	---	---	GWB	---	GWB	---	GWB	---	EXP	---	VARIES	---	P3	P3	SEE NOTE 2 FOR ELEV CAB FINISHES
202	MECH. SHAFT	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
203	CONNM	CONC	EXP	---	---	---	---	---	---	---	---	---	P2	2700	---	P3	P3	---
204	ELEC	CONC	EXP	---	---	---	---	---	---	---	---	---	P2	2700	---	SSTL	SSTL	---
205	STAIR 1	CONC	EXP	---	---	---	---	---	---	---	---	---	---	VARIES	---	---	---	METAL RAIL -- TO MATCH MED. ANODIZED BRONZE
206	STAIR 2	CONC	EXP	---	---	---	---	---	---	---	---	---	---	VARIES	---	---	---	METAL RAIL -- TO MATCH MED. ANODIZED BRONZE
207	STAIR 3	CONC	EXP	---	---	---	---	---	---	---	---	---	---	VARIES	---	---	---	METAL RAIL -- TO MATCH MED. ANODIZED BRONZE


THIRD FLOOR INTERIOR FINISH SCHEDULE

THIRD FLOOR INTERIOR FINISH SCHEDULE																				
RM NO.	ROOM NAME	FLOOR	BASE	WAINSCOT			WALLS				CEILING			CABINETRY		DOORS	TRIM	REMARKS		
				MATERIAL	HEIGHT	NORTH	COLOR	EAST	COLOR	SOUTH	COLOR	WEST	COLOR	MATERIAL	COLOR				HEIGHT	CABINETS
300	BULK STORAGE	CONC	EXP	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2700	---	P3	P3	WM
301	ELEV. SHAFT	CONC	EXP	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P1	EXP	---	VARIES	---	P3	P3	SEE NOTE 2 FOR ELEV CAB FINISHES
302	MECH. SHAFT	---	---	---	---	CMU	---	CMU	---	CMU	---	CMU	---	---	---	---	---	---	---	---
303	COMM	CONC	EXP	---	---	CMU	P1	CMU	P1	CMU	P1	GWB	P1	GWB	P2	2700	---	P3	P3	---
304	ELEC	CONC	EXP	---	---	CMU	P1	CMU	P1	CMU	P1	CMU	P1	GWB	P2	2700	---	P3	P3	---
305	STAIR 1	CONC	EXP	---	---	CMU	P1	CMU	P1	CMU	P1	EXP	---	VARIES	---	VARIES	---	---	---	METAL RAIL -- TO MATCH MED. ANODIZED BRONZE
306	STAIR 2	CONC	EXP	---	---	CMU	P1	CMU	P1	CMU	P1	CMU	P1	EXP	---	VARIES	---	---	---	METAL RAIL -- TO MATCH MED. ANODIZED BRONZE
307	STAIR 3	CONC	EXP	---	---	CMU	P1	CMU	P1	CMU	P1	CMU	P1	EXP	---	VARIES	---	---	---	METAL RAIL -- TO MATCH MED. ANODIZED BRONZE

ROOM UNIT MODULE INTERIOR FINISH SCHEDULE


ROOM UNIT MODULE INTERIOR FINISH SCHEDULE																		
RM NO.	ROOM NAME	FLOOR	BASE	WANSKOT		WALLS						CEILING		CABINETS		DOORS	TRIM	REMARKS
				MATERIAL	HEIGHT	NORTH	COLOR	EAST	COLOR	SOUTH	COLOR	WEST	COLOR	MATERIAL	HEIGHT			
10	LIVING/SLEEPING	CP	RB	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P2	---	---	S1	P3	SS, MB
11	CLOSET	CP	RB	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P2	---	---	---	P3	SHELVING
12	TOILET	PP1/2/PP2	---	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2400	PLAM	SS	P3	SS, SCR, SC
13	KITCHEN	PP1/2/PP2	---	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2400	S1	SS	---	SS
14	LIVING/SLEEPING	CP	RB	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2400	---	---	P3	SS, MB
15	CLOSET	CP	RB	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2400	---	---	P3	SHELVING
16	TOILET	PP1/2/PP2	---	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2400	PLAM	SS	P3	SS, SCR, SC
17	TOILET	PP1/2/PP2	---	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2400	PLAM	SS	P3	SS, SCR, SC
18	CLOSET	CP	RB	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2400	---	---	P3	SHELVING
19	LIVING/SLEEPING	CP	RB	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2400	---	---	P3	SS, MB
20	ENTRY	PP1/2/PP2	---	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2400	---	---	P3	---
21	SOCAL SPACE	CP	RB	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2400	---	---	P3	---
22	LAUNDRY	PP1/3/PP3	---	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2400	---	---	P3	SHELVING
23	LIVING/SLEEPING	CP	RB	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2400	---	---	P3	SS, MB
24	TOILET	PP1/2/PP2	---	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2400	---	---	P3	SS, SCR, SC
25	CLOSET	CP	RB	---	---	GWB	P1	GWB	P1	GWB	P1	GWB	P2	2400	---	---	P3	SHELVING

COLOR/FINISH LEGEND:

AB: ANODIZED BRONZE, MEDIUM
AC: ACOUSTICAL CEILING
AC1: ARMSTRONG, CIRRIUS 534
AC1: ANGLED TEGULAR-MY-N 15/16" GRID SUSPENSION
CP: CARPET - CONTINUOUS FLAMMENT, BRANDED COMMERCIAL MINIMUM THREE (3) COLOR, SOLUTION DYED 
CONC.: CONCRETE, EXPOSED W/SEALER
CG/CR: CORNER GUARD/CHAIR RAIL
CG: OUTSIDE CORNERS, INTERNAL COLOR
CG: CHAIR RAIL @ 36" OFFICE & MULTI-PURPOSE ROOMS
G: GROUT, PORCELAIN PAVEN
G1: FLOORS, MAPEL, 39 MORY OR OTHER NEUTRAL COLOR
G2: WALLS, MAPEL, 94 STRAW OR OTHER NEUTRAL COLOR
GWB: GYPSUM WALL BOARD
MB: MINBLEINDS-ALL EXTERIOR WINDOWS
P: PAINT (COLOR ONLY-SEE SEC. 09900 PAINT, GENERAL F
P1: FIELD WALL PAINT
P2: CEILING PAINT
P3: TRIM PAINT

REMARKS NOTES

1. SHOWER SURROUND: SHALL BE SS2 NEUTRAL COLOR
2. ELEVATOR CAB FINISHES:
 - FLOOR: SHALL BE CARPET (C) OR PORCELAIN PAPER (PP)
 - BASE: SHALL BE PLASTIC LAMINATE REVEAL BEHIND VERTICAL WALL PANELS
 - WALLS: WOOD LOOK PLASTIC LAMINATE WITH STAINLESS STEEL HAND RAIL/WALL GUARD
 - CEILING: STAINLESS STEEL CEILING WITH DOWN LIGHTS
 - DOORS: CENTER OPENING, STAINLESS STEEL
 - TRIM: STAINLESS STEEL
 - MISC: ELEVATOR SHALL HAVE HOOKS FOR WALL PADS



US Army Corps
of Engineers
Sacramento District

[illegible]

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Submitted by:	W. R. BELL
Chief, Hydrographic Des. Sec.	

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA
SACRAMENTO DISTRICT
MI-HOUSE DESIGN
1325 J' STREET
SACRAMENTO, CA 95814-2922

BEALE AIR FORCE BASE
CALIFORNIA
GLOBAL MARK DOMINATORY (06 RA)
PM BAW051001
BUILDING 24100
INTERIOR COLOR/FINISH
SCHEDULES

Sheet
reference
number:
A6.01